CLAIMS

1.

A pressure vessel comprising a substantially cylindrical periphery-wall portion having an inner space, and end-wall portions closing the both opposite ends of the periphery-wall portion, and being characterized in that at least part thereof comprises:

a metallic composite material comprising:

a light metal being turned into a matrix; and

a plate-shaped iron-based member which is buried in the light metal, whose major component is iron, which is provided with a large number of through holes penetrating through the front and rear surfaces, and in which the open area ratio is 13-30%.

2.

The pressure vessel set forth in claim 1, wherein at least part of said periphery-wall portion comprises said metallic composite material.

3.

The pressure vessel set forth in claim 1, wherein said light metal is an aluminum-based metal or a magnesium-based metal.

4.

The pressure vessel set forth in claim 1, wherein said iron-based member is such that the open area ratio is 18-28%.

5.

The pressure vessel set forth in claim 1, wherein said iron-based member is an expanded metal or a punching metal.

6.

The pressure vessel set forth in claim 1, wherein said iron-based member is a net-shaped body comprising a plurality of wire materials.

7.

The pressure vessel set forth in claim 1, wherein said iron-based member is such that the area of one through hole is 300 μm^2 or more.

8.

The pressure vessel set forth in claim 1, wherein said iron-based member is such that its surface is turned into a rough surface.

9.

The pressure vessel set forth in claim 1, wherein said iron-based member is such that the thickness is 0.5-2 mm.

10.

The pressure vessel set forth in claim 9, wherein said iron-based member is an iron-based cured member in which carbon and nitrogen are infiltrated in all parts in the thickness-wise direction by means of carbonitriding treatment.

11.

A compressor having a housing in which a compressing mechanism and a working space for compressing a gas with the compression mechanism are embedded, and being characterized in that at least part of the housing comprises:

a metallic composite material comprising:

a light metal being turned into a matrix; and

a plate-shaped iron-based member which is buried in the light metal, whose major component is iron, which is provided with a large number of through holes penetrating through the front and rear surfaces, and in which the open area ratio is 13-30%.

12.

The compressor set forth in claim 11, wherein:

said compression mechanism has a piston for compressing said gas by means of reciprocal movement provided with predetermined phase; and

said housing includes a cylinder block comprising said metallic composite material, and equipped with a plurality of cylinder bores for accommodating the piston.

13.

The compressor set forth in claim 11, wherein said housing includes a front housing comprising said metallic composite material, and equipped with a hollow cylinder portion.

14.

The compressor set forth in claim 11, wherein said housing

has an installation portion for fastening the compressor to an installed body, the installation portion protruding outward, formed integrally and comprising said light metal, and the tensile strength of the installation portion is 460 MPa or more.

15.

A process for casting a cylinder block, being characterized in that it comprises:

an iron-based-member allocation step of allocating a substantially cylindrical iron-based member, whose major component is iron, which is provided with a large number of through holes penetrating the front and rear surfaces and whose open area ratio is 13-30%, in a casting mold being provided with a hollow portion forming a molding cavity surface, which corresponds to the shape of a cylinder block, in cooperation with a core for a cylinder bore, and a pouring passage into which a molten metal is poured and which is communicated with the hollow portion, at least, coaxially with the core for a cylinder bore; and

a light-metal filling step of filling said molten metal of a light metal into said hollow portion through said pouring passage;

wherein said light metal is cast around said iron-based member by way of the steps.

16.

The process for casting a cylinder block set forth in claim 15, wherein:

said iron-based member has at least one cut-off at an opened end portion of the iron-based member, the cut-off being larger than

the area of one of said through holes, and is allocated so that the opened end portion is brought into contact with said molding cavity surface and spaces are provided on the front- and rear-surface sides of the iron-based member in said iron-based-member allocation step; and

the molten metal is filled into the entire hollow portion via the cut-off in said light-metal filling step.

17.

The process for casting a cylinder block set forth in claim 15, wherein said molding cavity surface has a holding portion for holding the opened end portion of said iron-based member.